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AUTHOR Redican, Kerry J.; And Others
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ABSTRACT

The purpose of this study was to assess the effects of a prototype health education curriculum as implemented by a specially trained health education specialist versus the effects of the same program as implemented by specially trained elementary teachers. The subjects for this study were black sixth-grade students in the lower socioeconomic level of society. Two groups of students were taught the prototype health education program by specially trained teachers using multi-media materials and a definitive teacher's manual. One group was taught by a health education specialist. A control group received regular health instruction by their teacher, who had not been exposed to the prototype health curriculum training. Students exposed to the prototype health education curriculum achieved significantly higher posttest mean scores than those receiving the regular health instruction. No significant difference was noted between those receiving the prototype curriculum from the specially trained classroom teacher and health education specialist. It appeared that through comprehensive inservice training, those elementary school teachers without a comprehensive health background can successfully implement a well-planned, comprehensive health education program. (JD)

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Health Knowledge Assessment of Selected Lower Socioeconomic Elementary School Students

Kerry J. Redican, Ph.D.
Assistant Professor
Medical and Educational Administration
Nebraska Center for Health Education
University of Nebraska
Lincoln, Nebraska

Larry K. Olsen, Dr.P.H.
Associate Professor of Health Education

and

Donald B. Stone
Professor of Health Education
Department of Health and Safety Education
University of Illinois
Champaign, Illinois

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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Some states currently have mandated laws with respect to the teaching of health education in the elementary schools. In some situations, the laws are relatively weak and do not clearly define the nature and scope of health education nor do they stipulate at which grade levels it is to be taught. Additionally, health education in the elementary school often focuses on the dissemination of health information rather than on the development of sound attitudes and positive behavior patterns.

It is important that all school age children be exposed to modern day, comprehensive health education programs. The need to evaluate existing programs to determine which ones appear to be most effective in providing maximum learning opportunities for sound decision making regarding one's health habits is also important. Evaluation of the effectiveness of various modes of implementation of health education programs also poses some interesting questions. It might be assumed that a person with a health education background would do a more effective job of implementing a given health education program than a regular classroom teacher who possesses little or no professional background in health education.

Purpose

The purpose of this study was to assess the effects of a prototype health education curriculum as implemented by a specially trained health education specialist versus the effects of the same program as implemented by specially trained elementary teachers with respect to the health knowledge of lower socioeconomic black sixth grade students.

Hypotheses

The major hypotheses that guided this study were:

(1) Students exposed to the prototype health education curriculum will achieve significantly higher health knowledge posttest mean scores than those students not receiving the program.

(2) Students exposed to the prototype health education curriculum as implemented by a specially trained health education specialist will score significantly higher health knowledge posttest mean scores than those students exposed to the program as implemented by specially trained classroom teachers.

Scope and Deliminations

The subjects for this study included 144 students, who completed all of the test measurements. The sample included students from two elementary schools in a low socioeconomic status community on the East coast and one inner city elementary school in the Midwest.

In the East coast sample, two classes were taught the prototype health education program by specially-trained sixth grade classroom teachers. A control class was also selected from the same school system. Students in the control class studied their regular school health curriculum taught by their regular classroom teacher. This teacher had not been exposed to the prototype health curriculum.

The Midwest experimental group was taught the experimental health curriculum by a specially trained health education specialist. A second sixth grade class was selected from the same school and served as a control group. This group of students received their regular health instruction taught by their regular classroom teacher, who had not been exposed to the prototype health curriculum. In both communities, the experimental curriculum covered a period of nine weeks of instruction, approximately one hour per day, five days per week.

Definition of Terms

In order to clarify terms used in this study, the following definitions were developed:

(1) Classroom teachers: referred to certified sixth grade teachers, both those who had participated in a SHCP teacher training workshop and those who had not.

(2) Health education specialist: referred to an individual whose academic background included a master's degree in health education.

(3) E1: referred to the experimental group in the Midwest sample.

(4) C1: referred to the control group in the Midwest sample.

(5) E2: referred to the experimental group in the East who completed both pre and posttests measures.

(6) E3: referred to the experimental group in the East who completed posttest measures only.

(7) C2: referred to the control group in the East.

(8) Lower socioeconomic status: For the purposes of this study, the definition of lower SES was primarily based on income levels, percentage of the population on welfare, and the respective city's evaluation of the community.

The School Health Curriculum Project: The sixth grade unit of the School Health Curriculum Project is a comprehensive health education program covering many different health content areas including drugs, nutrition, exercise, rest, sleep and relaxation, cardiovascular diseases, mental health, and consumer health. The unit consists of an introduction, five separate phases and a culmination.

This program is the only federally funded school health education program currently in existence. According to federal guidelines, the curriculum can only be taught by specially trained individuals. The only manner in which individuals can be trained is by attending a comprehensive inservice workshop designed to familiarize the participants with the philosophy and methods and materials used in the program.

The Heart Unit is a complete package of multi-media materials including a teacher's manual so that the trained teacher can follow the prescribed format and successfully implement the unit. Proper care of the body is the overall goal of the entire program.

Regular Health Instruction: Lectures and the use of a current elementary health education textbook comprised the regular health education received by the control groups. The content areas covered under the regular health instruction included: consumer health, mental health, communicable and chronic diseases, environmental health, personal health practices, and nutrition. Few individualized learning opportunities were provided for students during their period of regular health instruction.

Data Collection Instrument: Cooks's Cardiovascular Health Knowledge Test[2] was the instrument employed to determine cognitive changes in the sample population. This 45 question, four-response, multiple-choice instrument was developed specifically for the SHCP Heart Unit and had a demonstrated reliability (KR 21 = .862). The maximum score for the total knowledge test was 45.

Study Design: All groups received pre and posttests with the exception of one of the East Coast experimental groups which received the posttest only. Pretests were administered three days before the unit began and posttests were administered the day after the unit concluded.

Since three classes were used on the East Coast (two experimental and one control), a Solomon Three Group Design was utilized. This design enabled the investigators to account for the interactive effect of the pretest as well as the effect of the curriculum.[1]

Mean scores, standard deviations and t values were obtained for pre and posttest measures on the health knowledge instrument. Since the randomization of students to the various classrooms was not possible, an analysis of covariance was performed.

In order to utilize the Solomon Three Group Design, an analysis of variance was performed between posttest mean scores. In addition, a Sheffé test was employed to determine the direction of significance on the health knowledge posttest mean scores.

Analysis and Interpretation of Data

Midwest Sample: Pre and posttest mean scores and standard deviations were obtained for E1 and C1 students. A t-test between pretest mean scores of the E1 and C1 students revealed no significant differences at the .01 level. (See Table I) A significant difference at the .01 level was noted between E1 and C1 posttest mean scores. (See Table I)

INSERT TABLE I

Since the random assignment of E1 and C1 students was not possible, analysis of covariance was performed thereby statistically equating the two groups. (See Table II) The resulting F ratio showed a significant difference at the .01 level between E1 and C1 students. Based on the error of estimate, posttest mean scores were adjusted. (See Table III) The significant F ratio was in favor of the experimental (E1) students who received the special health program. Midwest students exposed to the prototype health education curriculum did achieve significantly higher health knowledge posttest mean scores than those students not receiving the program. Thus, hypothesis one was partially accepted.

INSERT TABLE II

INSERT TABLE III

East Coast Sample: Pre and posttest mean scores were obtained for the East Coast experimental (E2) and control groups (C2). (See Table IV) A t-test of significance between pretest mean scores revealed a significant difference at the .01 level between the experimental and control students.

INSERT TABLE IV

Since these groups had an initial difference that was significant at the .01 level, an analysis of covariance was applied to statistically equate the two groups. (See Table V)

INSERT TABLE V

The resulting F ratio showed a significant difference at the .01 level between the two groups. (See Table V) Posttest mean scores were adjusted, and the significance was in favor of the experimental (E2) group, who received the special health program from their regular classroom teachers, who had participated in a special training program. (See Table VI) This lends further support to the acceptance of hypothesis one.

INSERT TABLE VI

In order to determine if the pretest predisposed students to respond in a particular manner, the Solomon Three Group Design was applied. Subsequently, an analysis of variance was used to determine if a significant difference existed between the experimental and control groups. (See Table VII)

INSERT TABLE VII

The resulting F ratio revealed a significant difference between the group posttest mean scores. In order to determine where the significant differences occurred, a Sheffe' test was utilized. This test revealed no significant difference at the .01 level between posttest mean scores of the experimental E2 and E3 groups. However, significant differences at the .01 level were noted between the posttest mean scores of the experimental groups and the control group. Since no significant differences were noted between the posttest mean scores of the two experimental groups, the effects of the knowledge pretest appeared to be minimal.

Owing to significant differences beyond the .01 level being noted between posttest mean scores of the Midwest experimental and control groups (E1 and C1) and between the East Coast experimental and control groups (E2, E3 and C2). Hypothesis 1 was accepted. Thus, those students receiving the special health program did achieve significantly higher posttest health knowledge mean scores than those students receiving their regular health instruction.

Analysis of Implementation by Specialist vs Classroom Teacher: In order to determine if the experimental group in the Midwest (E1) and East Coast experimental students (E2) were significantly different after exposure to the special health program as implemented by a specialist versus a classroom teacher, it was necessary to compare their pre and posttest mean scores. (See Table VIII) A t-test of significance applied to their pretest mean scores revealed a significant difference at the .01 level. (See Table VIII) Since this initial difference was noted, an analysis of covariance was performed to statistically equate the two groups. (See Table IX)

INSERT TABLE VIII

INSERT TABLE IX

The analysis of covariance revealed no significant posttest difference at the .01 level between the two groups. Posttest mean scores were adjusted based on the error of estimate generated from the analysis of covariance. (See Table X)

INSERT TABLE X

Since no significant difference was noted at the .01 level between the two experimental groups, it appeared that the Midwest experimental (E1) group did not score significantly different on the posttest than the East Coast experimental (E2) group. Based on these results, hypothesis 2 was rejected. Thus, it appeared that both the specialist and specially trained classroom teacher could produce comparable health education knowledge gains in lower SES sixth grade students.

A significant difference beyond the .01 level was noted between the posttest knowledge mean scores of the Midwest experimental (E1) and control groups (C1). This level of significance was also noted between the East Coast experimental (E2 and E3) and control groups (C2). These differences were in favor of the experimental groups who received the special health

education program from their specially trained classroom teacher or the specially trained health education specialist. In addition, the mean score gains of the experimental students in groups E1 and E2 were relatively large.

These findings were to be expected, since it has long been established that cognitive retention will occur over a short period of time. Veenker reported that health knowledge can be assessed in short period appraisals through pretesting and posttesting.[4] Cook and Olsen[3] reported that students receiving the SHCP Heart Unit of instruction achieved significantly higher knowledge mean scores at the .05 level than did their contemporaries receiving regular health instruction. It must be noted that Cook and Olsen's study was completed in a predominantly white middle class school. The current study suggests that the prototype curriculum is also quite effective in predominantly black low SES schools.

No significant differences were noted at the .01 level between adjusted posttest mean scores of the Midwest experimental (E1) and the East Coast experimental (E2) students. However, the mean score gains pre to posttest were greater for the Midwest experimental group (E1) than the East Coast experimental group (E2). This finding may be attributed to three important factors: teacher effects, health content background differences between the trained classroom teachers and the health education specialist, and a plateau of cognitive retention.

The teachers on the East Coast were black females teaching in an all-black school. Neither teacher on the East Coast had taught formal health education classes prior to participating in the SHCP Heart Unit workshop. Therefore, their only exposure to health education was through the special training workshop.

Conversely, the health education specialist was a white male. The health education specialist seemed to establish an immediate rapport with the

students. The most obvious reason for this was that students in the Midwest class had someone new and different teaching them. These children had not been previously exposed to young white male teachers, but surprisingly responded in a very affectionate manner.

It was not known how the students on the East Coast responded to their regular classroom teachers because no daily log was kept. However, it can be assumed that the groups probably responded in the same manner as the Midwest control group (C1) students responded to their regular black classroom teacher who was also a female.

A second possible explanation was that the health education specialist had a stronger content background than the specially trained classroom teachers thus could more readily respond to students' needs and interests. This response could have, in part, accounted for the mean score gain for the Midwest experimental students.

Another possible explanation for the difference in mean score gains between experimental classes E1 and E2 rests with the fact that E2 students had been exposed to the fifth grade unit the previous year so they had already used similar materials. The experimental group in the Midwest had never been exposed to the special health program prior to this study. Accordingly, their excitement with respect to the multi-media approach to health education, combined with a young white male teacher acting as a greater mean score gain.

Finally, a plateau of cognitive retention could have taken place with respect to these special health units. In other words, although pretest differences may be evident, the end result will not be statistically significantly different. On the unadjusted posttest mean scores between E1 and E2, there was no significant difference at the .01 level. After adjusting the posttest mean scores, still no significant difference was noted at the .01 level. This finding led the investigators to speculate that, although the E1

students had a significantly lower pretest mean score, they achieved almost the same posttest mean scores as the E2 students who started at a higher pretest mean score. Statistically, the posttest mean scores were comparable, even taking into account the differences in teachers and geographic locations.

Since significant differences were beyond the .01 level between health knowledge posttest mean scores of all experimental and control groups, it appeared that the program had a positive effect on the experimental groups. The combination of the special teacher training workshop, multi-media equipment, student interest and motivation among the experimental students. This could possibly account for their significantly higher posttest health knowledge mean scores.

Since the posttest mean between students exposed to the prototype health education curriculum by a specially trained health education specialist was not significantly different than the posttest mean achieved by students taught the same curriculum by their specially trained classroom teachers, the second hypothesis was rejected.

Conclusions

Students exposed to the SHCP Heart Unit achieved significantly higher ($p>.01$) health knowledge posttest mean scores than those students receiving their regular health instruction. This finding was observed for both the Midwest and East Coast experimental groups. Therefore, it appeared that the SHCP Heart Unit had a positive impact on the health knowledge mean score gains of lower SES sixth grade students. In addition, it was observed that the knowledge mean score gains, pre to posttest for the experimental groups were significant beyond the .01 level and the control mean score gains were not significant at the .05 level.

No significant difference was noted at the .01 level, pretest to posttest,

between those experimental students that received the SHCP Heart Unit from the health education specialist and those experimental students that received the SHCP Heart Unit from their specially trained classroom teachers. Therefore, it appears that through comprehensive inservice teacher training, those elementary school teachers without a comprehensive health background can, in fact, successfully implement a well-planned comprehensive health education program.

1. Ary, D., L. C. Jacobs, and A. Razabieh. Introduction to Research in Education, New York: Holt, Rinehart, and Winston, Inc., 1972, p. 89.

2. Cook, R. J. Development of a Sixth Grade Knowledge Test, (Unpublished Master's Thesis, University of Illinois), 1973, p. 81.

3. Cook, R. J. and L. K. Olsen. "Assessment of the Cognitive Effect of a Prototype Health Education Curriculum on Sixth Grade Students," Journal of School Health, (September, 1975), p. 390-393.

4. Veenker, C. H. Synthesis of Research in Selected Areas of Health Instruction, Washington: School Health Education Study, 1963, p. 62.

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TABLE I

Comparison of Mid-est Experimental and Control (E1 and C1)

Pre- and Posttest Health Knowledge Mean Scores,

Standard Deviations, and t Values

Group	N	Pretest $\bar{X}$	Pretest SD	Pretest t	Posttest $\bar{X}$	Posttest SD	Posttest t
E1	33	11.43	3.01	.18	27.77	4.26	16.31*
C1	31	11.21	3.54		11.41	2.93	

*Significant beyond .01 level

TABLE II

Analysis of Covariance of Midwest Experimental (E1) and Control (C1) Group Health Knowledge Scores

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Between	1	4330.68	4330.68	993.48*
Within	63	270.63	4.35	
Total	64	4601.31		

*Significant beyond .01 level

TABLE III

Adjusted Health Knowledge Posttest Mean Scores for Midwest Experimental (E1) and Control (C1) Groups

Group	N	Observed Means		Adjusted Posttest Mean
		Pretest	Posttest	
E1	33	11.43	27.77	27.992
C1	31	11.21	11.41	11.557

TABLE IV

Pre- and Posttest Health Knowledge Mean Scores, Standard Deviations, and t Values for the East Coast Experimental (E2) and (E3) and Control (C2) Groups

Group	N	Pretest			Posttest	
		X	SD	t	X	SD
E2	29	18.37	3.13	15.82*	27.76	3.00
E3	22	-	-		26.25	2.97
C2	26	10.03	3.21		11.32	2.02

*Significant beyond .01 level

TABLE V

Analysis of Covariance Between Health Knowledge Mean Scores of the East Coast Experimental (E2) and Control (C2) Groups

Source	Degrees of Freedom	Sum of Squares	Mean Square	F
Between	1	934.67	934.67	179.04*
Within	54	271.45	5.22	
Total	55	1206.12		

*Significant beyond .01 level

TABLE VI

Adjusted Health Knowledge Posttest Mean Scores for East Coast Experimental (E1) and Control (C2) Groups

Group	N	Observed Means		Adjusted Posttest Mean
		Pretest	Posttest	
E2	29	18.37	27.76	27.35
E3	22	10.03	26.25	
C2	26		11.32	12.06

TABLE VII

Analysis of Variance Between Posttest Health Knowledge Mean Score of the East Coast Experimental (E2 and E3) And Control (C2) Groups

Source	Degrees of Freedom	Sum of Squares	Mean Square	F
Between	2	5972.85	2896.25	252.94*
Within	74	847.66	11.45	
Total	76	6640.51		

*Significant beyond .01 level

TABLE VIII

Pre and Posttest Health Knowledge Mean Scores, Standard Deviations, and t Values Between the Midwest (E1) and East Coast (E2) Experimental Groups

Group	N	Pretest $\bar{X}$	Pretest SD	Pretest t	Posttest $\bar{X}$	Posttest SD	Posttest t
E1	33	11.43	3.01	11.22*	27.77	4.26	.61
E2	29	18.37	3.13		27.76	3.00	

*Significant beyond the .01 level

TABLE IX

Analysis of Covariance Between Midwest (E1) and East Coast (E2)

Experimental Group Health Knowledge Scores

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F
Between	1	3.77	3.77	.2078
Within	61	882.66	14.46	
Total	62			

TABLE X

Adjusted Posttest Health Knowledge Mean Scores for the Midwest (E1) and East Coast (E2) Experimental Groups

Group	N	Observed Means		Adjusted Posttest Mean
		Pretest	Posttest	
E1	33	11.43	27.77	26.91
E2	29	18.37	27.76	27.43